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PUBLIC HEALTH REPORTS

VOL. 32 NOVEMBER 2, 1917 No. 44

THE DIAGNOSIS OF POLIOMYELITIS.[1]

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Acute poliomyelitis is a name given to a specific infectious disease which sometimes, but not usually, results in paralysis. The ability to diagnose the disease in the absence of paralysis has only recently come to us, although Caverly of America in 1894 and Wickman of Sweden in 1907 described such cases; if paralysis occurs, it is usually after the disease itself is well on its way, so that diagnosis of the nonparalytic stages and the nonparalytic cases is doubly important for the protection of contacts and for the institution of measures of treatment. Though preeminently a disease of children it is by no means rare in adults, and the less urban the community the higher the average age of those affected.

Draper and Haynes have emphasized two stages in the progress of the disease; first, that of general systemic symptoms, and, second, that of invasion of the central nervous system, by way of the meninges. They mention the interval of apparent recovery or improvement, which frequently occurs between these two stages, but that is not the whole story; the disease is very commonly one of remissions at every stage. Though we can not speak with such assurance about the systemic stage, it is probable that here also, as is repeatedly observed in the meningitic and in the paralytic stages, there are remissions and regressions.

The pathologic picture which will best convey the progress of the disease is first that of a general infection, in a sick child or an indisposed adult; second, a meningitic invasion, from a very mild to a severe meningitis; and third, in some cases an extension of the infection into the anterior horns of gray matter in the spinal cord and to a less extent into other parts of the central nervous system, with weakness, paralysis, and definite localized nervous symptoms. The stages may be clinically simultaneous, though usually meningeal signs precede an evident paralysis. Any two of these three stages may be absent, or at least so slight or transient as to pass undiscovered.

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[1] Read before the Augusta County Medical Society at Staunton, Va., August 17, 1917.

Systemic Symptoms.

It must be admitted that the diagnosis in the systemic stage can be made only rarely, usually only in the presence of an epidemic. The symptoms may simulate any of the indefinite illnesses of childhood, and in the presence of an epidemic it is well for parents and physicians to treat sick children having fever without a definite proven diagnosis as possible cases of poliomyelitis. Still, there are groupings of symptoms which are very suggestive. Fever is the most common single symptom and may be of any grade. It is usually of short duration, and frequently accompanied by headache, sometimes by flushing. It is remarkable that in this acute febrile disease which occurs predominantly in the earlier years of life and which attacks the nervous system, convulsions should be so infrequent; though by no means unheard of, a history of convulsions in most epidemics inclines one against, rather than toward, the diagnosis of poliomyelitis.

The onset of this systemic stage is frequently insidious, but in many cases very acute and often accompanied with vomiting, as in scarlet fever. The vomiting, if it occurs, is not usually prolonged, and by many parents is attributable to an evident indiscretion in diet, and not to the disease. Occasionally there are pains in the stomach. Intestinal symptoms are very frequent, constipation more so than diarrhea. In reports of some epidemics, but none in which I have had personal experience, cases with diarrhea exceed those with constipation. This brings out the fact that in different epidemics, in different localities of the same epidemic, and in different periods in the same locality, there may be minor differences in symptomology, fatality, and other characteristics of the disease, just as there are evidently differences in virulence or infectivity. Thus in the Hessian epidemic of 1909 respiratory symptoms predominated, while in the neighboring Westphalian cases of the same year, and in the Stokes River Devonshire outbreak of 1911, diarrhea was prominent; the Vermont epidemic of 1894 and the Austrian of 1908 included a considerable proportion of onsets with convulsions. But the general picture throughout the world is so nearly uniform, and so different from any other known morbid condition, that even without our laboratory evidence we could not help regarding poliomyelitis as a distinct clinical entity, a specific infectious disease, just as different from other diseases as is diphtheria or tuberculosis.

One of the common symptoms which frequently aids in diagnosis at this stage is drowsiness; the child falls asleep repeatedly in the daytime. The opposite symptom, that of restlessness, or irritability, is also encountered, even in the same patient; a naturally cheerful, playful child becomes cross and resents interference, objecting sometimes to being petted by its own mother. This change in disposition, and the stupor, are referable to the sensorium, but, even though there may be absolute delirium or coma, these do not constitute certain evidence of cerebral infection. Two other symptoms, which are very frequent and which when present tend to confirm the diagnosis, are retention of urine and sweating out of proportion to the air temperature.

Sore throat is not uncommon, but other symptoms referable to the upper respiratory tract are rather rare, considering the fact that according to the most generally accepted theory the virus enters the body by this route. The same peculiarity is observed in epidemic cerebrospinal meningitis.

This description covers the most common symptoms of this stage. Other symptoms, such as chills, cough, dizziness, or rashes may occur but are not particularly suggestive of the disease. Herpes labialis is rare, an important point in differentiation from epidemic meningitis. It may be argued that there is nothing distinctive about this clinical picture, and that the symptoms enumerated are merely those which may occur in any sick child, and which may pass off without a definite diagnosis being made. But the combination of fever, vomiting, constipation, drowsiness, and irritability, especially when combined with headache, a transient flushing of the face, abnormal sweating, or retention of urine, is enough to make a tentative diagnosis of poliomyelitis if frank cases are occurring in the vicinity.

Cases with gradual onset, malaise and indefinite symptoms, can not be diagnosed before the appearance of meningeal or paralytic signs, if such signs do appear; but an onset with one or more remissions is very suggestive of poliomyelitis. The more careful the inquiry into the histories, the more frequently will such onsets be found. The remissions are of varying length, and may be as long as one or more weeks.

Meningeal Symptoms.

The greater part of the symptoms which I have described as systemic might also be included as evidence of involvement of the central nervous system. But the chief definite symptoms of the slight degree of meningitis commonly met with in poliomyelitis are pain on spinal flexion, hyperesthesia, and increased reflexes. Of these, pain on anterior flexion of the spine as described by Wickman and by Peabody, Draper, and Dochez, is perhaps the most frequent and characteristic. Enough meningeal involvement to cause real opisthotonos or retraction of the head, is not the rule in poliomyelitis; but pain on forward nodding of the head, and especially pain on forward bending of the lower spine, is very frequent and characteristic. This latter sign is elicited by placing one of the examiner's arms under the flexed knees, and the other under the patient's neck. On attempting to lift the patient in this way, a voluntary stiffness and a pain in the back are elicited. In testing for this sign, as in examining the reflexes and motor functions to be mentioned later, it is of great importance to deal with the utmost gentleness. The patient is usually a child, and unless one can obtain his good will and confidence, much of the examination is useless. It is well, therefore, to proceed first with the examination of the strength of various muscles, and the reflexes, before attempting manipulations which may cause pain. The degree of meningitis may or may not be sufficient to give a positive Kernig's sign: Inability to extend the knee fully when the thigh is flexed at right angles to the body. One of the most persistent signs of the disease, often remaining after all acute symptoms have subsided, is popliteal pain, which when investigated is found to be due to hypertonicity of the hamstrings. Other signs of meningitis and consequent increased pressure of the cerebrospinal fluid, such as MacEwen's and DeLepinay's, also more complex signs such as Brudjinski's, might be elicited. Even Babinski's sign, indicating involvement of the upper motor neurone, may rarely be present.

Definite evidence of meningeal inflammation may be obtained by lumbar puncture and examination of the spinal fluid. It goes without saying that this procedure should be followed if the meningeal symptoms are at all severe, in order to relieve the pressure and in order to rule out other forms of meningitis. The increased pressure with a clear or nearly clear fluid containing no organisms, a cell count over 10 per cubic millimeter, and increased albumen and globulin, when found, are of great diagnostic value. But unless the puncture is made by one with some skill in the technique, and under proper aseptic precautions, more harm than good may be done. Flexner and Amoss have shown that even slight hemorrhage into the subarachnoid space may possibly determine an infection which would otherwise be warded off. A thorough examination of the patient and consideration of the history will, in the usual case, enable a diagnosis to be made as positively without as with a lumbar puncture.

One symptom attributed in part to meningeal involvement is pain, or rather hyperesthesia. The tenderness may be of the skin, on deep pressure of the muscles, or on motion of the joints. It is a most characteristic symptom of the disease, yet has frequently misled physicians into the diagnosis of rheumatism or of neuritis. The hypersensitiveness may be general, or of one part of the body only. This is very suggestive of peripheral inflammation, and one would hardly look to the spinal cord for an explanation unless on the watch for poliomyelitis. But no swelling accompanies the pain of poliomyelitis. The distribution of the tenderness, moreover, is not confined to certain joints or certain nerves, but involves areas corresponding rather to segments of the spinal cord.

One other word regarding sensory disturbance deserves to be emphasized for the sake of diagnosis. While the microscopic histology of the disease shows some involvement of the sensory tracts along with the predominant motor disturbance, and while at the beginning we have this clinical evidence of sensory irritation just as we have of motor irritation to be described later, in the case of the sensory system these changes only rarely go on to a degree of degeneration which is easily demonstrable in life. The "root fields" of the skin, corresponding to different segments of the spinal cord, overlap so much that it takes a considerable cord injury to produce loss of sensation in any area, and if posterior horn lesions were severe in poliomyelitis, herpes zoster would be more frequent in this disease. To put it more plainly, anesthesia, if prominent, inclines one against the diagnosis of poliomyelitis. Local loss of sensation is found in some cases of the disease, but it is a minor feature. This is of especial help in the diagnosis of paralysis in adults; if the anesthesia approximates the motor paralysis in degree and extent, with a history dissimilar to that above outlined, the disease may indeed be anatomically poliomyelitis, that is, an inflammation of the gray matter of the spinal cord, but it is not the specific infectious disease of which we are speaking.

The motor phenomena of the meningitic stage may, like the sensory phenomena, be attributed to irritative lesions of the nerve cells rather than simply to a meningitis. One of the most noticeable of these phenomena is a tremor, brought out especially if the limbs are extended unsupported, or if muscular effort is attempted. The parents may also at times notice twitchings, but the tremor is more characteristic of the disease. Unsteadiness in action, in gait, or in standing, may amount to a pronounced ataxia and has abundant explanation in the pathological anatomy of the disease.

In these examinations in the acute stage it is to be remembered that the chief therapeutic need is rest in bed, and a sick child should not be made to walk across the room, or put through muscular exercises more than is necessary to establish the diagnosis and to ascertain indications for local treatment. Often the examination can be more successfully made by prolonging it over several visits, different portions of the body being examined each time. Physiologic rest in the proper posture often enhanced by supports or removable plaster casts to prevent the stretching of weakened or painful muscles, is indicated for the first month or two, any other treatment being subsidiary to this. Later, passive movements, massage, and especially muscle training, are to be begun; but for both these phases of treatment accurate anatomical diagnosis is essential, in addition to the mere knowledge of the existence and general distribution of the disease.

Hardly any part of the examination of the patient gives more valuable information in poliomyelitis than an examination of the reflexes, combined with which are tests of voluntary movement and tonicity of the muscles. Electricity has not proven of much value in either diagnosis or treatment. In the irritative stage we are likely to find irregular increases in the reflex response, with perhaps some spasticity, and as a rule the earliest definitive sign of degenerative changes in the peripheral motor neurone is a diminution in one or more of the reflexes. This is especially important in young children, for in the age group most commonly attacked by poliomyelitis, it is difficult to secure voluntary muscular effort at command, and one may be in doubt of anything short of an absolute flaccid paralysis, unless the break in the nerve conduction is revealed by definite absence of reflex. However, in young children, over one year of age, the reflexes are fortunately more regular, and more easily elicited, than in adults; the adults seem to have more inhibitory paths. But even here care must be taken, by repeated trials and by testing under the most favorable conditions, before a reflex is put down as absent. A unilateral increase or decrease in reflexes, present on different examinations, is of course more significant than a symmetrical absence. In this disease the deep reflexes, obtained by striking tendons, muscles, or bones, are supposedly more important than the superficial reflexes; but much valuable information can be obtained from the latter.

To obtain the deep reflexes, it is worth while to provide one's self with a proper percussion hammer. The percussion hammers sold at present are all unsuitable for this work. The rubber is usually too hard and the weight in some cases insufficient for older children and adults. The hammer which I use may be improvised from stout wire and two rubber erasers. The rubber should above all be very soft, so that one can demonstrate its pliability to the patient, and so that a sharp blow really gives no pain. Into a slot at one end of the twisted or soldered wire handle is inserted the smaller eraser, a common red or green desk eraser with beveled ends about 2½ by ⅝ by ¼ inches, for percussing the tendons of very small infants. For larger children a larger eraser has been found to be more satisfactory. This may be purchased at draftsmen's or artists' supply shops and is about 2½ by ¾ by ½ inches and very soft. To aid the precise percussion of a tendon one end and one side may be beveled with a sharp knife. It is convenient to carry this heavier eraser separate in the pocket and to insert it in the handle of the hammer, which is then reversed for use when needed.

Of the deep reflexes one of the most important is the patellar, or knee jerk. This is best elicited, not as is described in some textbooks by supporting the leg under the knee with the examiner's arm or the edge of the bed or chair, but by allowing the quadriceps muscle to relax as completely as possible, the patient being recumbent, the heel resting on the bed, and the knee semiextended at an angle of about 135°. The knee should be hit repeatedly just above the tibial tuberosity and the response of the muscle ascertained by the examiner's hand on the thigh; true contractions are thus distinguished from mere jarring. Sometimes part of the muscle may respond more actively than the remainder. The reflexes in both knees should be accurately compared together. Significant differences in response, short of total abolition, may be obtained.

In many adults and some young children there is need to reinforce the reflexes, as it is called, by diminishing the inhibition and tonicity. A method usually successful is to distract attention and cause muscular effort to be made in another part of the body; thus if the knee jerks are being tested the patient is directed to try to pull his clasped hands apart, while looking in another direction.

The Achilles tendon reflex, or ankle jerk, is no less important than the knee jerk in this disease. Other deep reflexes which may be obtained with greater or less regularity in young children are the biceps, elicited by a blow on the arm 1 inch above the fold of the elbow; the triceps, obtained by hitting the back of the arm 1 inch above the olecranon; the scapulo-humeral, giving adduction of the arm on striking the inner side of the scapula with the hammer; the radial, giving supination of the forearm in response to a blow on the styloid process; the hamstring, giving flexion of the leg on percussion of the tendons back of the knee; the tibialis anticus, a blow on the tendon external to the lower third of the tibia causing flexion and supination of the ankle; and the peroneal, a blow on the tendon above and behind the external malleolus. It may be remarked that some of these reflexes are not always obtainable in health, but we have the two sides of the body for comparison, and even with the lesser reflexes a constant discrepancy between the two sides is significant. Increase of reflexes in the irritative stage is as important as decrease in the paralytic stage.

Of the superficial reflexes, those of the trunk are of the greatest importance in this disease, for they may give a hint of oncoming paralyses in muscles of the back and abdomen. These paralyses are often overlooked, but are of serious moment on account of resultant disability and deformity. The lumbar reflex is a contraction of the lumbar muscles in response to stroking the skin of the back below the twelfth rib. A splintered wooden tongue depressor is a good instrument for eliciting the superficial reflexes, a pin point is somewhat too sharp. *The epigastric reflex is a drawing in of the epigastrium caused by stroking from either nipple downward.* The upper, middle, and lower abdominal reflexes consist similarly in localized contractions of the anterior abdominal wall on local irritation of the overlying skin surface. The gluteal reflex, a contraction of the gluteal muscles when the fold of the nates is stroked, is also of considerable importance in this disease. Other useful superficial reflexes are the scapular, elicited by stimulating the skin internal or external to the scapula; the pectoral, an adduction of the arm when the anterior axillary fold is stroked; the cremasteric in the male, obtained by stroking the inner thigh; and particularly the plantar, a flexion of the toes when the sole is stroked, usually accompanied by a drawing up of the foot, thus demonstrating activity on the part of the anterior tibial, hamstring, and hip flexor muscles.

Some of these reflexes may be found to be exaggerated in the irritative stage, and later diminished or abolished. Diminution of reflexes is probably a step in the direction of paralysis; it is likely, in fact, that if the muscular strength could be tested accurately, some weakness would be made out in those cases where there is definite reflex disturbance. One may be in doubt as to whether a reflex not obtained may be due to natural inhibition or to the disease, but we always have the corresponding reflex on the other side of the body for comparison and with this considerable list some asymmetry is likely to be made out if there is any real motor disturbance.

Even in the absence of an epidemic, a chain of general or systemic symptoms such as those previously described, combined with the spine sign, local hyperesthesia, and tremor, would be sufficient for a tentative diagnosis of poliomyelitis. An asymmetrical reflex disturbance would make this diagnosis definite, though if the meningeal signs were at all pronounced, other forms of meningitis should first be ruled out by lumbar puncture. No one of these signs or symptoms is necessary, however, and in the presence of an epidemic diagnoses can be made on much less. The more characteristic some of the symptoms are, the less is required in confirmation. Pneumonia and some other severe acute illnesses of childhood may cause meningeal symptoms; the physical examination of the patient should be thorough enough to discover these diseases if present. From post-mortem findings and from most clinical histories it may be doubted whether the paralysis of poliomyelitis ever occurs without some degree of meningitis; but the physician is frequently called to cases where history and evidence of definite meningitic symptoms are both lacking.

Paralytic Symptoms.

As the diminution in reflex responses is, strictly speaking, a part of the paralytic phenomena, so also is a general weakness which is often encountered. This weakness is out of proportion to the febrile disturbance and may keep the patient from his usual activities for some time without even being definitely localizable to certain muscle groups. This is one of the reasons for the confusion, which has arisen in some quarters, of poliomyelitis with influenza. It is needless to say that poliomyelitis is a perfectly definite disease, proven by the occurrence of typical paralytic cases with characteristic pathology, while influenza is a name under which we hide many illnesses whose causation we do not know. It might well be that many of our cases called influenza are really poliomelitis, but we can hardly say that influenza is responsible for infantile paralysis when we do not even know whether Pfeiffer's bacillus has any relation to the former disease. We do know the cause of poliomyelitis; that is, we know that it is a filterable virus with certain definite properties.

In regard to the paralysis in poliomyelitis, I desire to emphasize four points:

1. A great proportion of the cases, probably the majority, are not recognized as paralytic. These nonparalytic cases have, in the past, been reported in considerable numbers only where epidemics have been very carefully studied. In many instances, in fact, paralysis has been the criterion for diagnosis.

2. Even in the paralytic cases, weakness is the rule, absolute paralysis occurring in less than 20 per cent of the muscle groups affected. If in the field we could apply to the transitory cases delicate tests such as Lovett's spring-balance test for muscle function, and Martin's electrical sensory test, it is likely that we should find slight degrees of impairment of motion and of sensation much more common than at present.

3. The paralysis, when it occurs, is typically flaccid. There may be increased tonicity in the early stages, but in poliomyelitis, permanent spastic paralysis is rarer than anesthesia.

4. Though examples are on record of involvement of the nucleus of every cervical and spinal nerve, the distribution of the paralysis is to some extent typical. Certain muscles are much more commonly affected than others, and at times a slight impairment of a single muscle determines the diagnosis.

The legs are more often paralyzed than any other region, the occurrence of toe drop testifying to the frequent involvement of the lower leg muscles. The toe muscles themselves are usually spared. Weight bearing appears to have a deleterious influence on recovery, so that in the old cases, especially, leg paralyses are greatly in excess. Arm paralyses follow next in frequency, particularly those involving the deltoid muscle. In regard to paralyses in other parts of the body, statistics vary in different epidemics and with different observers, not only on account of variations in the degree of delicacy in tests for muscle function, but also because in some series the observations are made early in the acute stage and in others later, when muscle training or other orthopedic treatment is begun; some paralyses are very transient, and clear up before the period of quarantine is past.

The commonest head muscle to be affected is the external rectus of the eye, giving convergent squint. This paralysis of the abducens muscle is often incomplete, and the attempt to obviate double vision may cause enough eye strain to produce ocular congestion. Slight degrees of facial palsies are very frequent, more so than the records would indicate, because recovery is usually prompt in these bulbar cases, and because the palsies are often so slight as to be unnoticed even by the child's parents. The paralysis may be detected only in certain positions of the face; one eyelid or one side of the mouth may droop. Forced movements, such as grinning, or whistling, or raising the eyebrows, will at times bring out the asymmetry, at other times mask it. Throat paralysis, causing difficult swallowing, aphonia, or regurgitation through the nose, is a very serious symptom. Many such cases prove fatal, but whether the fatality is usually due to paralysis of the bulbar centers of respiration, to extension of the paralysis to the neighboring centers of the phrenic nerve in the cervical cord, or to local paralysis in the throat and pulmonary infection, is still an open question. Poliomyelitis typically affects the ganglion cell of the lower motor neurone, and not the higher centers; certainly the great majority of fatalities from poliomyelitis are due to paralysis of the muscles of respiration directly, that is, the spinal nuclei of the phrenic and intercostal nerves.

Slight pareses of the neck muscles may be detected in an asymmetrical position of the child's head when upright or in an inability to raise the head against pressure when recumbent. In the case of the abdominal and back muscles the skin reflexes previously mentioned may be of assistance, or lack of strength in certain trunk movements and postures, even local bulging of the abdominal wall.

Like the facial and abdominal paralyses, slight degrees of intercostal paralysis are frequently overlooked. A child's breathing is largely abdominal; but in poliomyelitis wards, cases of entire intercostal inactivity in ordinary respiration are very common. Diaphragmatic paralysis is the most serious phase of poliomyelitis, particularly when combined with intercostal paralysis. It is easily detected in severe cases, the abdomen moving inward in inspiration instead of outward. Severe intercostal paralysis on the other hand, causes a sinking of the chest wall in inspiration. A piece of cotton may be held near the child's mouth to get the respiratory rhythm in these reversed cases. With such severe paralysis the prognosis is very bad. It usually forms a part of what was formerly called Landry's paralysis, an ascending or descending paralysis involving other muscles as well. The respiratory difficulty, as a rule, is not like that in laryngeal diphtheria or croup; there is little stridor, or evident muscular exertion in breathing, the patient is too weak. Lesser degrees of intercostal or diaphragmatic palsy may be detected by compressing the abdomen or the chest to watch for consequent respiratory difficulty.

In some of the fatal cases death is so sudden that the cause is not apparent. Indefinite symptoms may have preceded for one or more days without the paralysis being evident to either parents or physician, especially in infants and younger children. Yawning has been frequently observed as a very serious symptom. During the prevalence or suspected prevalence of poliomyelitis it is wise to require necropsies with histological examination of the spinal cord and brain in all the acutely fatal illnesses in children, unless the cause of death can be clearly established to be other than poliomyelitis. Many histories obtainable after death are not at all suggestive of the disease, though microscopic examination demonstrates poliomyelitis changes in the cervical cord.

In the upper extremity the deltoid is the muscle most typically involved. Tests for the function of this muscle may be made in the upright position by allowing the baby to reach for the percussion hammer or some other object held above his head, first with one hand and then with the other, or by playing up and down with the arms until the tonicity and muscular strength in each may be estimated. Except the opponens pollicis, which orthopedic tests have shown to be very commonly attacked, the muscles most often impaired in this section are those of the shoulder and upper arm.

In the lower extremity the anterior tibial and lower leg muscles bear the brunt of the attack, though here no part is spared. It has long been recognized that the virus of the disease appears to have an affinity for the lumbar enlargement of the spinal cord. Trivial paralysis or paresis of leg muscles is to be searched for by stimulating the action of each group; with older children the different movements can be asked for systematically, but in infants such reflexes as the plantar must be used. Besides testing the strength of the flexors and extensors of the hip, knee, ankle, and toes, one should not neglect the abductors and adductors of the hip. Comparison of the strength of the two sides is easily made by having the patient recumbent, the knees flexed and the heels resting on the bed; slight degrees of weakness in ability to bring the knees together or to separate them against the pressure of the examiner's hands may thus be detected. One peculiar circumstance is that paralysis of the rectal and urinary sphincters is unusual except in completely paralyzed, fatal cases.

All motions of the limbs should be made by the examiner repeatedly, to detect lack of tonus and of resistive efforts which may be very definite in the youngest baby, and even in an unruly child. Gait, going up and down stairs and on the level, should be observed in ambulatory cases; also the steadiness with which the patient can stand with eyes closed. The older the patient the more complete is the examination, and the less obscured are the slight degrees of muscular impairment. It is not to be expected that all these tests and reflexes will be made on every patient at the first visit, but enough should be completed to establish the diagnosis; and the more data one has the more certain will the conclusions be. The patient should in any case be stripped, and given an examination thorough enough to exclude other diseases.

It is thus seen that the diagnosis of poliomyelitis is not a simple matter, depending on a single factor or sign, but that the whole history and physical examination must be taken into consideration; and, when that is done, there are enough idiosyncrasies and predelictions of the disease to enable a diagnosis to be made with as great certainty as is usual in the diagnosis of other diseases, even without what was formerly considered the essential feature of the malady, permanent paralysis.

EXTRA CANTONMENT ZONE REGULATIONS.

ORDINANCES ENACTED BY THE CITY OF LOUISVILLE, KY., COOPERATING WITH THE UNITED STATES PUBLIC HEALTH SERVICE IN THE SANITARY CONTROL OF THE CIVIL ZONE AROUND CAMP ZACHARY TAYLOR.

The ordinances printed below have been recently adopted by the city of Louisville, Ky., for the purpose of protecting the health of the residents of the city and of preventing the spread of communicable diseases to the troops now in training at Camp Zachary Taylor near the city.

These ordinances were passed in pursuance of the plan of cooperation by States and municipalities with the Public Health Service to protect the military and naval forces of the United States from communicable diseases which may exist or gain a footing in the zones surrounding the mobilization camps. They will also protect the inhabitants of the city.

The ordinance requiring prompt notification of cases of preventable diseases will be especially valuable at this time by giving to the officers in charge of the zone knowledge of the existence of foci of infection in time to enable them to take measures to check the spread of the diseases.

These ordinances do not comprise a complete health code, but supplement ordinances previously enacted.